

Division of Forensic Science  
TRACE EVIDENCE PROCEDURES MANUAL

Amendment Designator:

Effective Date: 31-March-2003

## 14 pH METER

- A.** The pH meter is calibrated prior to each use using a 3-point calibration method. Refer to the individual pH meter's instrument manual for these procedures.
- The reference buffers chosen should bracket the expected pH value range of the sample(s) to be analyzed, if possible.
  - Record the pH values on the pH meter calibration log sheet. The pH values must be within  $\pm 0.1$  units of the pH value stated on each individual reference buffer's labeling.
  - The electrode slope must be within the range: 92%-102%. While this is the range cited for 2-point calibrations, it will also be applied here to the 3-point calibration method.
  - If the calibration values are within the accepted limits, the pH meter is ready to use for samples.
  - If the calibration values are not within the accepted limits, rerun and/or troubleshoot as appropriate.
- B.** Rinse the electrode with deionized water or the buffer, standard or sample, as appropriate.
- Inspect the electrode for scratches, cracks or salt crystal deposits prior to each use. Clean or replace the electrode in response to the discovery of these deficiencies, as appropriate.
  - Do not wipe the pH electrode glass bulb.
  - Short term storage is any period of time that is less than long term storage which is defined as greater than one week.
  - For short term storage: Store in an electrode storage bottle containing pH storage solution. A covered beaker containing sufficient storage solution to cover the sensing element may be used.
  - For long term storage: Fill the reference chamber with filling solution and cover the fill hole. Put a few drops of pH storage solution into an electrode storage bottle or electrode protective cap and cover the sensing element and reference junction. OR Cover the sensing surface with the protective cap and store dry.
  - Do NOT store the electrodes in deionized water.
- C.** Reference buffers are not automatically replaced after their stated expiration dates as long as their calibration values remain within  $\pm 0.1$  units of the stated pH.
- Choose pH buffers that are no more than three pH units or no less than one pH unit apart.
  - Keep the buffer bottle tightly sealed and free of contamination.
  - Do not reuse an aliquot of buffer or return it to the original bottle.
- D.** For best results use good laboratory practices.
- Pure water samples (e.g., deionized water blanks) may result in noisy electrode response and may require a long stabilization period particularly if used after a buffer with high ionic strength. The sample may also be contaminated if adequate rinsing is not performed.
  - Refer to the pH meter instrument manuals for recommendations of good laboratory practices, correct applications, problem samples and troubleshooting.